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# THE ROOFED GALLERY ON THE WALLS OF ATHENS

[PLATE VI]

THE most recent discussion of the well-known decree relating to the repairs of the fortification walls of Athens in 306 B.C.<sup>1</sup>

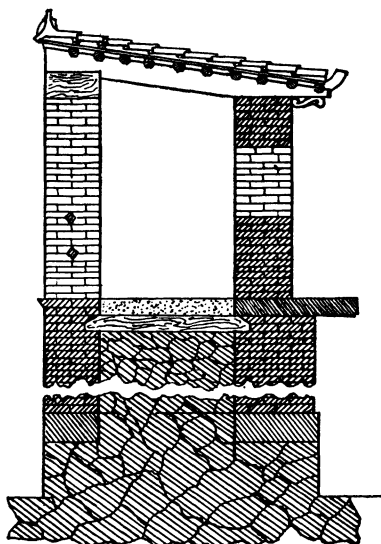
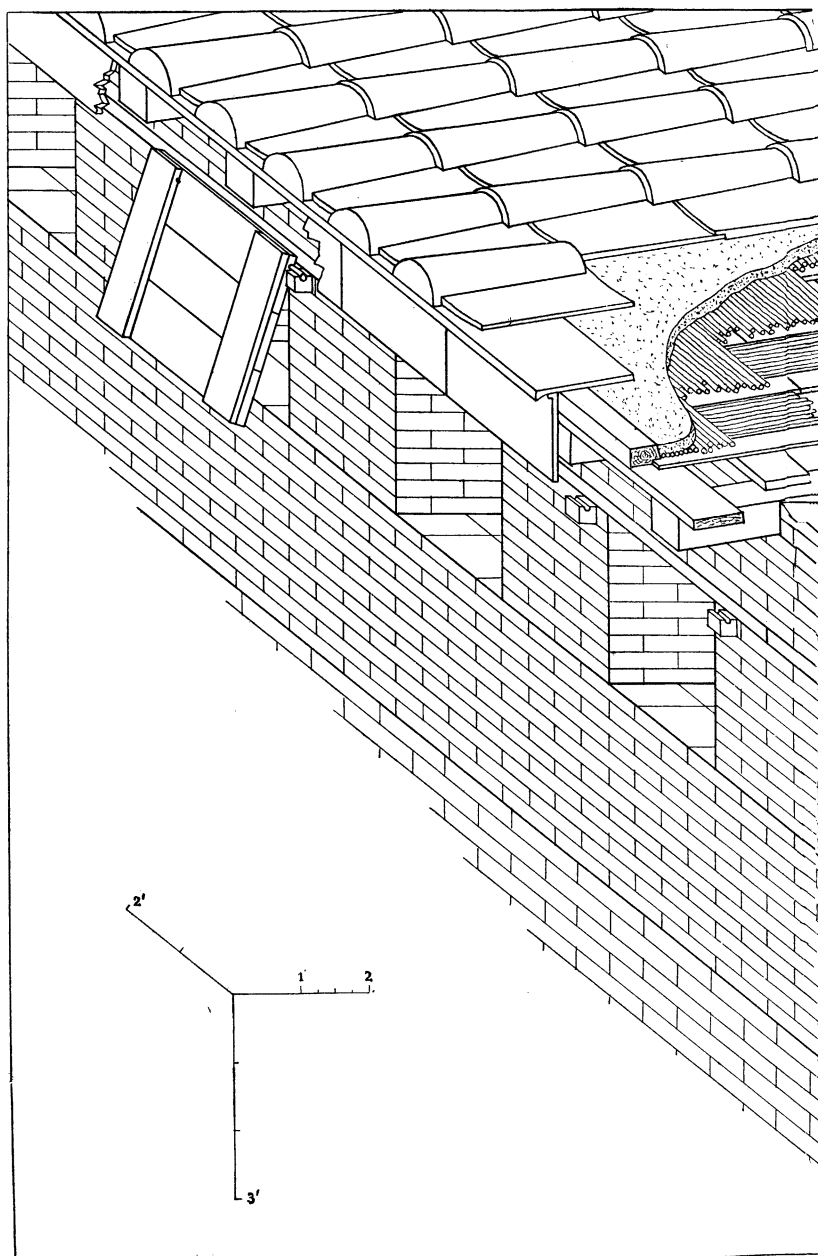


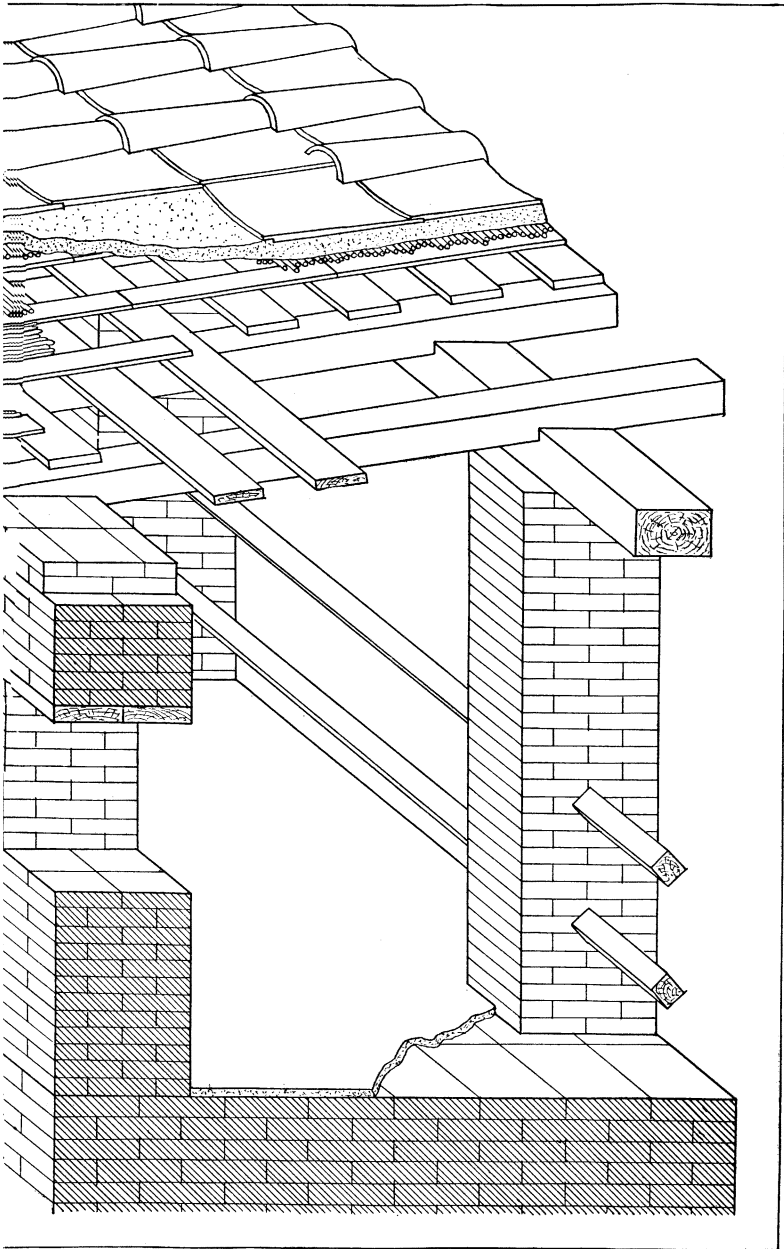
FIGURE 1. — MÜLLER'S RESTORATION  
OF THE GALLERY.

concerns itself less with the architectural than with the historical and topographical problems raised by the inscription, and Dr. Frickenhaus has not attempted a restoration of the roofed gallery along the top of the walls. Neither of the two previous attempts at such a restoration is satisfactory. That of Müller (Fig. 1) is correct in its main features, but wrong in a number of details. Choisy (Fig. 2) writing half a century later was able to correct some of these errors; but by misinterpreting certain statements in the text and trusting too much to his own

<sup>1</sup> Frickenhaus, *Athens Mauern im IV Jahrhundert*, pp. 29-43. Previous discussions of the inscription are: Franz, *Bull. dell' Inst. Arch.*, 1835, pp. 49 ff., from a copy by Pittakis. K. O. Müller, *De munimentis Athenarum*, Göttingen, 1836, from a copy by Ross. (Reprinted without the plates in *Kunstarch. Werke*, IV, pp. 88 ff.) Rangabé, *Antiquités helléniques*, II, 771. Leake, *Topography of Athens*, I, Appendix XX, pp. 607 ff. Ussing, *Zeitschr. für Alt. Wesen*, 1848, p. 49. Koehler, *I.G.* II, 167, from a new copy. The same, *Ath. Mitt.* V, 1880, p. 276, note on the date of the inscription. Choisy, *Études épigraphiques*



RECONSTRUCTION OF THE GALLERY ON



THE WALLS OF ATHENS. ISOMETRIC

imagination he has produced a restoration which Fabricius not unjustly characterizes as a step backward rather than an advance upon Ottfried Müller.<sup>1</sup>

In view of the importance of the passage as an architectural document a new attempt to obtain a more accurate picture of the structure seems justified. The present discussion will be limited to the architecture of the gallery, which may be conveniently treated as a subject by itself. The text of the passage, fortunately contained in the least mutilated part of the inscription, is as follows:—

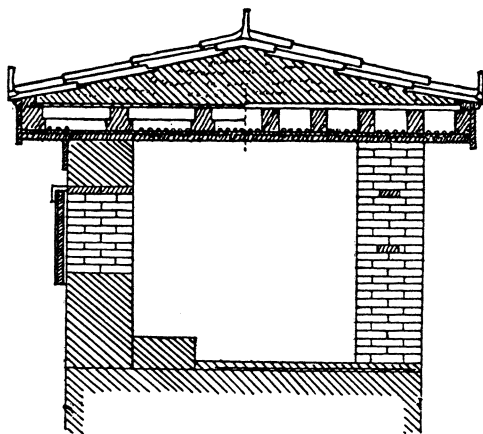


FIGURE 2. — CHOISY'S RESTORATION OF THE GALLERY.

- - - καταστεγάσει δὲ κα[ι] τὴν πάροδον<sup>53</sup> [τοῦ κύκλ]ου τοῦ περὶ  
[.....τοῦ] διατειχί[σμ]α[τ]ος καὶ τοῦ διπύλου τοῦ ὑπὲρ τῶν  
πυλῶν<sup>54</sup> [καὶ τὰ μα]κρ[ᾶ τ]είχη, ἐπα[νε]λῶν τοῦ π[ε]ριδρόμου τὰ  
55 γε[ι]σ[α] καὶ τῶν ἐπάλξεων πάντα· ὅσα (δ)' ἂν ᾖ π[ι]<sup>55</sup> [ε]πονη]κότα  
πλέον ἔξ δακ[τ]ύλων πλινθοβολήσῃ, δ[ι]α[λ]είπων θυρίδας δ[ι]πλίν[θ]-  
ους, ὕψος ποιῶ<sup>56</sup> [ν τοῦ μ]ε[ν] ἐπαλξίου τρεῖς πόδας, τ[ῆ]ς δὲ θυρίδος δέκα  
στοίχους· καὶ ἐπιθήσῃ ὑπερτόναια ξύλ<sup>57</sup> [ινα γο]μφώσας διάτοιχα πάχος  
στο[ι]χιαῖα, μῆκος ὀκτώποδα· ὑποθήσῃ δὲ καὶ κύβους τοῖς ὑπ[ε]ρ<sup>58</sup> [ερτο]-  
ναίοις καὶ ἐπιπλινθοβολήσῃ ὕψος [ε]ξ στοίχους. οἰκοδομήσῃ δ[ε] καὶ ἐκ  
τοῦ ἐνδοθεν<sup>59</sup> [στ]όχους οὐ μὴ εἰσιν οἰκοδομή[μ]ενοι διπλίνθους δι[α]λεί-  
60 ποντας ἐπτά πόδας, καὶ ἐγκατοικ[ο]ομήσῃ στρωτήρας [δ]ύο διαλείπον-  
τας τ[ρ]ί' ἡμιπόδια, ὕψος ποιῶν τοῦ στόχου ὥστε ἀνορθο[ί]<sup>61</sup> [ς] εἶναι εἰς  
τὸ εἶσω· καὶ ἐπ[ι]θήσῃ δοκοὺς εἰς το[ῦ]ς στ[ό]χους. οὐ μὴ κατεστ[έ] [γ]α-

sur l'architecture grecque, pp. 43 ff. Fabricius, *Berl. phil. Wochenschr.* IV, 1884, pp. 1118 ff., review of Choisy's work. Wachsmuth, *Die Stadt Athen*, II, pp. VI ff.

<sup>1</sup> Choisy's restoration is accepted by Perrot and Chipiez, *Histoire de l'Art*, VII, p. 387 and Fig. 207. Durm also reproduces Choisy's drawing (*Handb. der griech. Arch.*<sup>3</sup>, Fig. 167, p. 192), but in his text assents to the criticisms of Fabricius.

- σται, στεγάσει δοκί<sup>[62]</sup>[σιν] καὶ ἐπιβλή[σ]ιν τι[θ]εῖς ἐναλλάξ, ἡ στρωτῆρ-  
 σιν περ[ι]ενκεντρῖσει δι[αλ]είπων [τ]ρεῖς παλ<sup>[63]</sup>αστ]ὰς ἐκ τοῦ ἐπάνωθεν.  
 καὶ διοικο[δ]ομήσας ἐπὶ τοῦ το[ί]χου ἀνατεμεῖ τὸ γ[ε]ι[σ]ηπό[δ]ισμα  
 ὁρθ<sup>[64]</sup>[ὸν π]αρὰ πλευρὰν ὑπερέχον μὴ ἔλατ[τ]ον τρί' ἡμιπό[δ]ια, καὶ ἐπι-  
 65 κρούσει ἀκρογείσιον ποιῶν ὁ<sup>[65]</sup>[ρθό]ν κατὰ κεφαλὴν, πλάτος ἐπτὰ δακτύ-  
 λων, πάχος παλα[σ]τῆς, παρατεμῶν ἐκ τοῦ ἐνδοθεν πάχο<sup>[66]</sup>[ς ἰμ.]άντος καὶ  
 τὸ μέτωπον ποιήσας πρὸς τὴν κα[τ]αφορά[ν]. ἐπικρούσει[ι] δὲ καὶ εἰς τὸ  
 ἐντὸς ἰμ[ά]γ<sup>[67]</sup>ν[τ]ας διαλείποντας τρεῖς παλαστὰς, πάχος δακτύλου, [π]λάτος  
 πέντε δακτύλων, ἥλοις σιδη[ρ]<sup>[68]</sup>οῖ[ς]. καὶ [ἐ]πιβαλὼν [κ]άλαμον λελαμμέ-  
 νον, ὑποβαλ[ὼν] λοβὸ[ν] ἡ κάλαμον, δο[ρ]ώσ[ε]ι πηλῶι ἡχυρω[μέ]<sup>[69]</sup>ν[ω]ι  
 πάχος τριδακτύλ[ω]· κ[αὶ] κεραμώσει Λακω[νικῶ]ι κερ[ά]μωι τοῦ μὲν  
 70 κύκλου πᾶσαν τὴν π[ά]ρο<sup>[70]</sup>δ[ον], τῶν [δὲ] μακρῶν τείχων τὰς ἡγεμόνας οὐ  
 μὴ εἰσιν κείμεναι, [τ]ιθεῖς ὅλας ἐν πηλῶι ὁρ[θὰ π]α<sup>[71]</sup>ρὰ πλευρ[ᾶν].  
 καὶ κ[α]λυπτῆρ[ε]ί, τιθεῖς τοὺς καλυπτῆρας ὅλους ἐν πηλῶι· καὶ  
 ἀπογειώσ[ει] ἐκ<sup>[72]</sup> τοῦ ἔξωθεν γείσοις Κορινθίοις, ἀναξῶν το[ῦ]ς  
 [ἀ]ρ[μ]οὺς ἀρμόττοντας καὶ τιθεῖς ὁρ[θὰ παρὰ π]α<sup>[73]</sup>λευρὰν καὶ κατὰ  
 κεφαλὴν. καὶ ποήσας κα[ν]θήλιον .. δορώ[σ]ει πηλῶι ἡχυρωμένω-  
 [ι .....]<sup>[74]</sup>υτρεχὲς ὕψος τετ[τ]άρων στοίχων. - - -

The text differs in some details from that of Koehler in the *Corpus*. The more important variants are given here. Line 53. τοῦ περὶ [τὸ ἄστ]υ ἀνευ ? το]ῦ Koehler. Wachsmuth places a comma after πυλῶν. Line 54. [καὶ τὰ μα]κρ[ά Frickenhaus. [ἐπὶ ? τὰ μα]κρ[ά Koehler. ἐπα[νε]λῶν Frickenhaus. ἐπ[ι-βα]λῶν Koehler. Koehler places no punctuation mark after πάντα. Wachsmuth places a comma after γείσα and after πάντα. ὅσα (δ) ἂν ᾖ π[ε]πονη]κότα Lattermann, on the evidence of a Delian inscription, *B. C. H.* xxxii, 1908, p. 296. ἐ[ξεστη]-κότα ? Koehler, Frickenhaus. Line 60. ἀνορθο[ύς] εἶναι earlier editions. ἀνορθό[ν θ]εῖναι Frickenhaus. Line 70. ὁρ[θὰ πα]ρά Koehler. ὁπ[ὰς πα]ρά Frickenhaus, but without explanation. Line 72. [ἀ]ρ[μ]οὺς Schoene, *Philonis mech. synt.* 80, 36, followed by Frickenhaus, [κ]ρ[ί]ους earlier editors. Line 73. [ἐκ]δορώ[σ]ει Rangabé, Frickenhaus. [-ι διάζωμα ἰθ]υτρεχὲς Müller. [-ι πλάτος εὐθ]υτρεχὲς Frickenhaus.

#### Translation :

. . . And he shall roof the gallery of the circuit wall around [the city (?) —] the cross-wall and the *dipylon* above the gates [and the] long walls, removing all the cornices of the *περίδρομος* and the parapets; and wherever there is an injury measuring more than six dac-

tyls he shall lay new bricks, leaving openings two bricks in width, making the height of the parapet three feet, that of the openings ten courses of brick; and he shall lay (over the openings and upon the piers between them) wooden lintels extending through the width of the wall, fastening them with dowels, the lintels to be one course of brick in thickness and eight feet long, and he shall place below the lintels blocks (of wood), and (upon the lintels) he shall lay six courses of brick. And he shall build pillars along the inner edge (of the gallery) wherever they are not already built, two bricks in width, seven feet apart. And he shall imbed in the pillars two beams a foot and a half apart (to serve as a railing), making the pillars of such a height that the roof shall have a slope (?), and he shall lay architraves upon the pillars. And where there is no roof he shall roof the gallery with rafters and planks, placing them cross-wise, or else he shall mortise square timbers (upon the rafters in place of the planks) setting them three palms apart ἐκ τοῦ ἐπάνωθεν. And having built up with brick (the spaces between the rafters) upon the wall, he shall trim the front ends of the rafters so as to be vertical, making them project not less than one foot and a half from the wall, and he shall nail on a beam as a crowning member of the cornice, making it straight on top, its width to be seven dactyls, its thickness one palm; and he shall cut a rabbet in its inner face of the thickness of a sheathing plank, and its front he shall make according to the line (of the ends of the rafters). And within he shall nail on with iron nails sheathing planks three palms apart, one dactyl thick, five dactyls wide. And after laying upon the sheathing moistened rushes and under these (*i.e.* between the planks) beanstalks or rushes, he shall cover the whole with a layer of clay mixed with straw three dactyls in thickness. And he shall lay Laconian tiles over the whole gallery of the circuit wall, and shall put in place the tiles (ἡγγέμενες) of the long walls wherever they are not in place, laying them all in clay with their faces vertical, and he shall lay the cover tiles all in clay. And he shall cover the front of the roof timbers with Corinthian cornices, trimming the joints so that they shall fit tightly, making them true vertically and horizontally. And having set up a scaffolding he shall put on a coating of clay mixed with straw to the height of four courses. . . .

The topographical problems raised by lines 52-54 do not concern us here. It is clear that the passageway along the top of the walls (πάροδος) is to receive a roof in places where no such roof existed, or where it had fallen into decay. Other

portions of the wall already had a roof, as appears from the phrase *οὐ μὴ κατεστέγασται* in line 61. The screen-wall (*περίδρομος*?<sup>1</sup>) which ran along the top of the main wall at its outer face is to have its cornices (slabs of terra-cotta which protected the exposed top of the wall) removed, and is to be repaired or rebuilt as the case may require. The specifications for the construction of this wall, the pillars to be placed along the inner edge of the gallery, and the roof they supported are recorded in lines 55-74. Though somewhat deficient as regards measurements, they furnish enough data for the restoration shown on PLATE VI.

The arrangement of the wall and pillars indicated by the plan (Fig. 3) is practically that of Müller and Choisy. Most

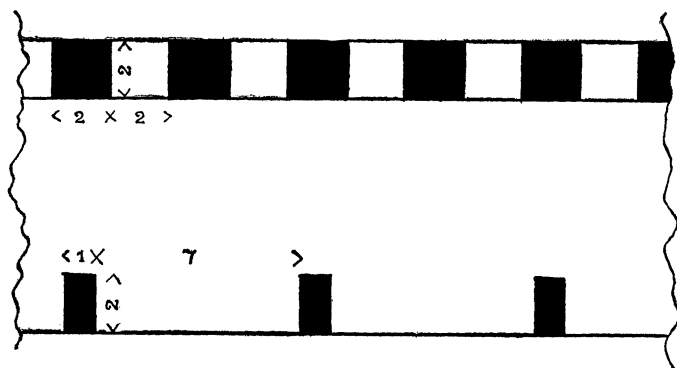


FIGURE 3. — PLAN OF GALLERY.

of the dimensions which are not given explicitly in the inscription can be inferred with reasonable certainty. Thus the length of the wooden lintels, 8 feet, fixes the width of the piers between the window openings as 2 or 6 feet, since otherwise a joint would come at intervals over a window. The arrangement with piers 2 feet wide is preferable since it allows twice

<sup>1</sup> This word has never been satisfactorily explained. Choisy supposed it to designate an unroofed passageway, *παρόδος* being used only for the roofed gallery. But in the two places in which the word occurs it is closely connected with *ἐπαλξίς*: line 54 *τοῦ περιδρόμου τὰ γείσα καὶ τῶν ἐπάλξεων πάντα*, and line 84 *τὸν περιδρόμον καὶ τὸ θωρακεῖον καὶ τὸ γείσων*. *Ἐπαλξίς* is clearly the low parapet (3 feet high, line 55) behind which the defenders stood. Upon the parapet piers were erected at frequent intervals. This crenelated wall as a whole (parapet and piers) is perhaps meant by the word *περίδρομος*.



as many defenders to be massed at any point of the wall. Only one dimension of the pillars is given, but since the space between them is stated to be 7 feet, it is probable that they were 1 foot (one brick) thick and placed opposite every second pier of the outer wall, as indicated on the plan. The restoration of this wall as 2 feet (two bricks) thick may be regarded as certain, though this dimension is not stated.

In PLATE VI the bricks have been drawn as 1 foot square and  $\frac{1}{4}$  foot thick, following Müller and Choisy. Vitruvius (II, iii, 3) states that the sun-dried bricks used by the Greeks were square, and distinguishes two varieties, the *πεντάδωρον*,  $1\frac{1}{4}$  foot square, used for public structures, and the *τετράδωρον*, 1 foot square, used for private houses. Bricks which have been preserved in fortification walls at Eleusis, measure on an average  $0.45 \times 0.45 \times 0.10$  m., or rather more than the *πεντάδωρον* of Vitruvius (= 0.41 m.). An inscription from Eleusis<sup>1</sup> mentions still larger bricks, *πλύνθιοι . . . τριημιπόδιοι* (= 0.492 m.). But for the light structure under discussion the smaller sized bricks (*τετράδωρον*) may safely be assumed. Used in conjunction with half-bricks (*ἡμιπλύνθια*, line 74. Cf. Vitruvius, II, iii, 4, *semilateria*) they fit perfectly the dimensions of the screen-wall and the pillars. The main wall was doubtless built of larger bricks, as has been indicated in the drawing. The thickness of the main wall is nowhere indicated in the inscription, for the good reason that it varied in different parts. Existing remains of the foundations in Athens and the Piraeus show that the walls varied from 2.50 m. to 8 m. in thickness. In PLATE VI the wall has been drawn as 10 Attic feet (= 3.28 m.) thick.

The wooden lintels (*ὑπερτόναια*) are restored by Müller as one line of planks 2 feet wide. Choisy assumes two rows of planks each 1 foot wide. The wooden blocks (*κύβοι*) placed below the lintels, according to Müller, are a device to hold the planks firmly in place (cf. Fig. 4). Choisy's explanation of them, as projecting from the face of the wall on either side of each window as supports for the shutters, is improbable.

The two beams (*στροπήρες*, line 60), which are to be built into the pillars  $1\frac{1}{2}$  feet apart, have in PLATE VI been placed

<sup>1</sup> Dittenberger, *Syll.*<sup>2</sup>, 587, lines 55, 57.

near the floor as a balustrade (so Müller). Choisy, as a result of his incorrect arrangement of the roof timbers, is obliged to place these beams higher up (see Fig. 2), their function being to strengthen the pillars.

The height of the screen-wall, assuming the bricks to be  $\frac{1}{4}$  foot thick, is  $7\frac{1}{4}$  feet. The height of the pillars is not given explicitly, and the statement with regard to it, *ὑψος ποιῶν τοῦ στόχου ὥστε ἀνορθο[ν] εἶναι εἰς τὸ εἶσω*, is obscure. Müller supposed the phrase *ἀνορθὸν εἰς τι* to signify that one part of a

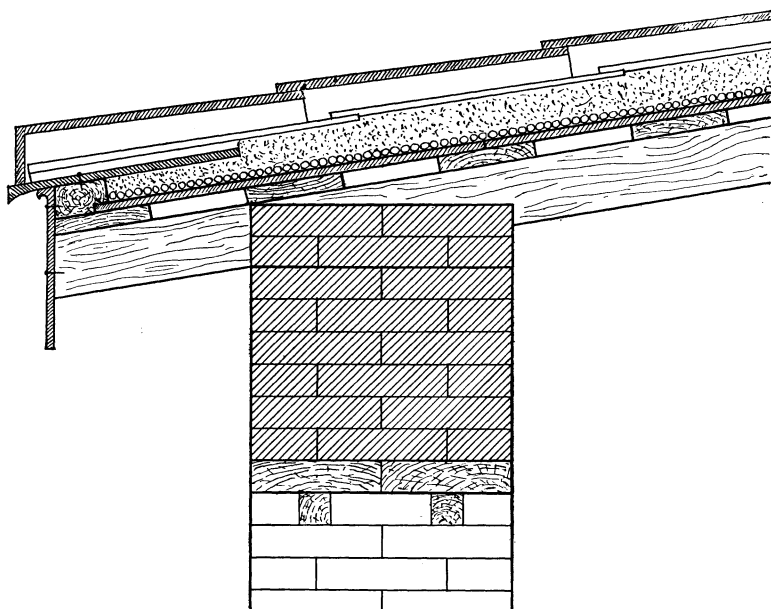


FIGURE 4.—SECTION SHOWING ROOF CONSTRUCTION.

structure is carried up to the level of another part. So here the top of the pillar is to be level with the top of the screen-wall, the latter being regarded as situated at the inner edge of the main wall. By making the beam (*δοκός*) laid upon the pillars as an architrave unnecessarily large (2 feet wide, 1 foot high), and by making the gallery one foot narrower than is done in the present restoration, he is able to give the rafters a sufficient slope (see Fig. 1). This interpretation of the phrase was adopted by Choisy since it fitted well with his erroneous

restoration of a roof with a slope in both directions (see Fig. 2). Wachsmuth proposed as a solution of one of the difficulties the emendation *εἰς τὸ ἔξω*. Frickenhaus restores ὥστε ἀνορθοῦ[ν θ]εῖναι, but without comment. Though I am unable to give a satisfactory interpretation of the sentence, I have attempted in the translation to suggest its general sense, on the theory that the prefix in ἀνορθός has a privative force, the word implying that the top of the pillar is *not* to be in line with the top of the wall; *i.e.* it is to be at a higher level. In PLATE VI the pillar is made 8 feet high. The additional  $\frac{3}{4}$  of a foot, together with the thickness of the architrave, gives the roof a rise of about 1 in 6. The rafters (δοκίδες) must have rested directly upon the top of the brick screen-wall, since no intermediate wooden member (wall-plate) is mentioned in the inscription. The explanation of the method in which they were held in place is afforded by the phrase καὶ διοικοδομήσας ἐπὶ τοῦ τοίχου (line 63), which seems not to have been understood by Müller, and is used by Choisy as evidence for his restoration of a roof with two slopes. The latter places the architraves (δοκοί) across the gallery, instead of from pillar to pillar, and the minor timbers over them. Upon this foundation he places a solid mass of clay nearly 2 feet thick in the centre, and sloping down on both sides to form a bed for the two series of tiles (see Fig. 2). But such a feature is entirely without parallels in Greek architecture and increases unnecessarily the weight of the roof. The phrase above quoted, which is the only evidence in support of this theory, can be explained in a much more simple manner. The τοίχος must be the screen-wall, and the prefix δια- suggests that the spaces on the wall *between* the rafters were to be filled with brick, the rafters being thus held firmly in place (see PLATE VI).<sup>1</sup>

The timbers to be laid across the rafters could be either ἐπιβλήτες or στρωτήρες<sup>2</sup> according to the preference of the con-

<sup>1</sup> Cf. Fabricius, *l.c.* p. 1118.

<sup>2</sup> The terms ἐπιβλήτης and στρωτήρ as well as δοκός, δοκίς, and ἰμάς occur in the inscription Dittenberger, *Syll.*<sup>2</sup>, 587. The prices paid give some idea of the relative size of these timbers: δοκός, 17 dr. (l. 62); δοκίς, 2 dr. (l. 87); στρωτήρ, 1 dr. 4 ob. (l. 63), 2 dr. 3 ob. (l. 85); ἰμάς, 1 dr. (l. 64); ἐπιβλήτης,  $\frac{1}{10}$  dr. (l. 65). The ἐπιβλήτες here evidently have a different function. They are perhaps comparable to our "furring strips." The form ἐπιβλήτοι occurs in line 193. The

tractor. The former were apparently planks which were laid upon the rafters (*ἐπιβάλλειν*); the latter were square beams mortised (literally: "grafted") upon them (*περιεγκεντρίζειν*). The former arrangement only is shown on PLATE VI and Figure 4. These latter timbers were to be placed  $\frac{3}{4}$  of a foot apart; the additional words *ἐκ τοῦ ἐπάνωθεν* have caused trouble.<sup>1</sup> For the following suggestion I am indebted to

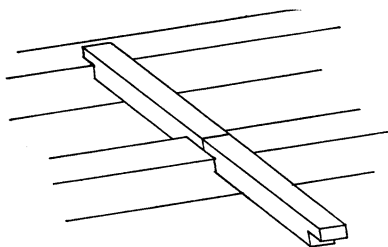


FIGURE 5. — ALTERNATIVE METHOD OF CONSTRUCTION.

Professor Fowler: "The *στρωτῆρες* were to be put about [*περι-*] the *δοκίδες* by a process of mortising; in other words, the mortises were to be cut in the *στρωτῆρες*, rather than in the *δοκίδες*, and the *στρωτῆρες* were to be *on the top* (*ἐκ τοῦ ἐπάνωθεν*) of the *δοκίδες* (Fig.

5). The passage in the inscription may perhaps be rendered, 'on the top he shall mortise [the rafters] round about with beams three palms apart.' If this is correct, the words *ἐκ τοῦ ἐπάνωθεν* modify not merely the expression *διαλείπων τρεῖς παλαστας*, but the entire clause."<sup>2</sup>

The projecting ends of the rafters are referred to in line 63 by the collective term *γεισηπόδισμα*,<sup>3</sup> which may be taken to

whole subject of the Greek technical terms for timbers used in building, for which this inscription furnishes abundant material, needs a thorough investigation.

<sup>1</sup> Fabricius, *l.c.*, interprets the passage: "nach der ersteren Lösung sollen quer über diesen *δοκίδες* (*ἐναλλάξ*), also in der Längsrichtung der Mauer, schwächere Balken liegen (die deshalb *ἐπιβλήτες* heissen), nach der anderen sollen die schwächeren Balken (*στρωτῆρες*) in die *δοκίδες* eingelassen werden (*περιεγκεντρίσει*), jedoch so, dass oben zwischen ihren Kopfen ein Zwischenraum von 3 *παλασται* bleibt." But if the *στρωτῆρες* were laid "in der Längsrichtung der Mauer," his expression "oben zwischen ihren Kopfen" as a translation of *ἐκ τοῦ ἐπάνωθεν* is meaningless.

<sup>2</sup> This interpretation does justice to the *περι-* of *περιεγκεντρίσει*, but the construction of the sentence is exceedingly awkward. The style of the inscription is, however, awkward at best. The provision that the *στρωτῆρες* shall be *ἐκ τοῦ ἐπάνωθεν* seems superfluous, but hardly more so than the previous provision that *ἐπιβλήτες* shall be *ἐναλλάξ* relatively to the *δοκίδες*. H. N. F.

<sup>3</sup> Also line 114, *γεισηποδί[σμη]ατι*. The more common form is used in line 51, *βράνος ἢ γεισήπους ἢ γείσον λίθινον ἢ κεραμεῦν*. Cf. Müller, *l.c.* p. 49.

include the plank (ἐπιβλήης) laid over them. They are to be sawn so as to be ὀρθὸν παρὰ πλευράν, *i.e.* their faces are to be in a vertical line. Over them is to be nailed a beam called ἀκρογείσιον, the correct explanation of which is due to Choisy. It is to be ὀρθὸν κατὰ κεφαλὴν; *i.e.* its top surface is to be parallel to the slope of the roof. Its face (μέτωπον) is to be in line with the face of the rafters.<sup>1</sup> The lower ends of the sheathing planks (ἱμάντες) are to fit into a rabbet cut at the bottom of its inner face.

The spaces left by the triple system of timbers (δοκίδες, ἐπιβλήτες or στρωτήρες and ἱμάντες) are to be filled by two layers of rushes, the upper layer being placed across the ἱμάντες, the lower (ὑποβαλὼν) apparently between them, resting on the ἐπιβλήτες. The whole surface of the roof is next to be covered (δορώσει, line 68<sup>2</sup>) with a layer of clay 3 dactyls thick, supported at the lower edge by the ἀκρογείσιον. As in the case of the Piraic Arsenal the tiles were imbedded in this layer of clay, a method which seems to have been generally employed in Greece for terra-cotta tiles, as holes for nails do not as a rule occur in existing specimens (cf. Fabricius, *Hermes*, XVII, 1882, p. 582). Marble tiles were probably laid directly upon the wooden sheathing, their weight being sufficient to hold them in place.

The inscription specifies that "Laconian" tiles are to be used, a variety which is also mentioned in the Eleusinian inscription, Dittenberger, *Syll.*<sup>2</sup>, 587, line 188, κεράμου Λακωνικοῦ ζεύγη: Ϙ: τὸ ζεύγος ΙΙΙΙ. Another type, the Corinthian, is mentioned more

<sup>1</sup> For the meaning of μέτωπον as an architectural term, see *A.J.A.* XII, 1908, p. 190. For the phrase πρὸς τὴν καταφοράν, cf. Dittenberger, *Syll.*<sup>2</sup>, 542, line 16, ἐπικόψας δὲ (τὸν λίθον ἑκαστον) κατὰ κεφαλὴν καὶ συνομαλίσας πρὸς τὴν καταφοράν. *I.G.* XII, 2, 10, line 16, πρὸς τὴν καταφοράν τοῦ τόπου. Dittenberger, *Syll.*<sup>2</sup>, 537, line 51, κορυφαῖα . . . ὑψος δὲ πέντε παλαστῶν καὶ δυοῖν δακτύλοις ἄνω τῆς καταφορᾶς. In all these cases there is the idea of a downward slope, the first two referring to sloping ground. The upper surface of the ridge-beam (κορυφαῖος) of the Piraic Arsenal was made with a slope in both directions to suit that of the rafters. Here the face of the ἀκρογείσιον is actually to be made vertical, but its plane when considered with reference to these timbers alone (ἀκρογείσιον, ἐπιβλήης, δοκίς) may be regarded as oblique.

<sup>2</sup> The meaning of this word is well known from its occurrence in the specifications for the building of the Piraic Arsenal, Dittenberger, *Syll.*<sup>2</sup>, 537, line 58. Dittenberger connects it with δορά, 'hide.'

frequently.<sup>1</sup> The identification of these two varieties is due to Dörpfeld (*Ath. Mitt.* VIII, 1883, p. 162). The Laconian tiles were of the more primitive type, shown in PLATE VI, consisting of slightly curved pan-tiles (*imbrices*) and semicircular cover-tiles (*tegulae*). The more elaborate system with large, flat *imbrices* and bent *tegulae* was called Corinthian, either because it was invented at Corinth or because the Corinthian factories were especially famous. That such tiles were not necessarily made at Corinth appears from the second passage quoted below, note 1. The theory that the tiles used to roof the Athenian fortification walls were of the curved shape receives some support from the fact that the excavations at the base of the walls on Eetioneia brought to light a large number of such tiles bearing the inscription δημοσία Πειραιέως (*B.C.H.* XII, 1888, p. 351). For examples of this type of tiles, cf. *Olympia, die Baudenkmäler*, II, pl. 98, where tiles from the Heraeum and other examples are figured.<sup>2</sup>

The correct explanation of γείσα Κορίνθια as a sheathing of

<sup>1</sup> Dittenberger, *Syll.*<sup>2</sup>, 537, line 58, κεραμώσει Κορινθίῳ κεράμῳ ἀρμόττοντι πρὸς ἄλλον. *Ibid.* 587, line 71, κεραμίδες Κορίνθιαί παρὰ Δημητρίου ἐν Λακιάδων οἰκοντος Η, τιμὴ Η. κομιδὴ τούτων Ἐλευσινάδε ΔΔΔΔ (evidently from an Athenian factory). Line 72, κεραμίδες κορίνθιαί ἐκ Κορίνθου, ἡ κεραμίς ΙΙΙΙΙ, κεφάλαιον ΗΨΔΓΓΙΙΙΙ. κομιδὴ τούτων Ἐλευσινάδε ΓΓΙΙΙΙ. Called also Κορινθοειδής at Delphi, *B.C.H.* XXVI, 1902, p. 42, line 35, Θευγένης Κνίδιος ἐδέξατο κέραμον παρίσχειν Κορινθοειδ[ῆ] προστεγαστήρα τῷ ναῷ. Corinthian tiles are mentioned also by Pollux, X, 182, κέραμον Ἀττικὸν καὶ Κορίνθιον, X, 151, καλυπτήρες Κορινθοιργεῖς.

<sup>2</sup> A different explanation of κέραμος Κορίνθιος has recently been advanced by Lattermann, *B.C.H.* XXXII, 1908, p. 298. Observing that ordinary tiles are bought in pairs (ζεύγη), consisting of an *imbrex* and a *tegula*, while the Corinthian tiles are usually bought singly, he argues that the latter were composed of an *imbrex* and a *tegula* made in one piece. But this is only a minor variation within one of two different types. Comparatively few examples of such double tiles have come down to us, and are not to be regarded as normal. The two specimens reproduced by Durm, *Baukunst der Griechen*,<sup>3</sup> Fig. 173, p. 199, belong at the edge of a roof; the front of the *imbrex* bears a painted pattern, and the *tegula* ends in an antefix in the form of an anthemium. They are special forms like the παραιτίδες ἡγεμόνες λεοντοκέφαλοι and the ἡγεμόνες ἔχουσαι τὸν καλυπτήρα (*I.G.* II, 807, lines 110 ff.) quoted by Lattermann. Such a refinement is more suited to the technique of marble, but here again examples of its use are very rare (Durm,<sup>3</sup> Fig. 177, Tholos at Delphi, Fig. 178, temple at Bassae). Lattermann maintains that the κέραμος Κορινθοειδής in the inscription from Delphi, which is paid for by the pair, is not really Corinthian. But if not, in what does the resemblance consist?

terra-cotta nailed against the ends of the roof timbers is due to Choisy. In the drawing on PLATE VI, I have assumed in addition to the vertical slab a horizontal one nailed upon the ἀκρογείσιον. This feature, which is necessary as a support for the first row of Laconian tiles, is taken from the roof of the Heraeum at Olympia.

The last sentence of the passage (ll. 73, 74) is obscure. Choisy supposes it to refer to a frieze of clay 1 foot high placed along the top of the screen-wall (see Fig. 2).

The wooden shutters, *θυρίδες κατάρακτοι*, have been restored in PLATE VI after Choisy, though the evidence of the inscription is not altogether clear.<sup>1</sup>

Finally, the floor of the gallery is to be paved with clay mixed with potsherds placed over a layer of rushes,<sup>2</sup> and the exposed vertical surfaces of the walls are to be plastered with a similar substance.

L. D. CASKEY.

MUSEUM OF FINE ARTS,  
BOSTON.

<sup>1</sup> Lines 75 ff. [ποιήσ]ει δὲ καὶ θυρίδας τοῦ ἄστεως τῷ κύκλῳ κα[τ]ὰ ἀρά[κτ]ους κατ' ἑπαλξιν --- [ἐ]παλξί[φ σ]τροφέα προσβάλλων καὶ συνγον[φώ]σας [ὑπ]οτρυνήσει π --- ιδε[. . . π]άχος ἑκαστον διδ[ά]κτύλους, καὶ ἀντι[ζυγ]ώσει δύνει ἀντιζυγοῖν - - κα]ὶ καθη[λώ]σ[ε]ι ἡλοῖς σιδηροῖ[ς] πλατέσ[ι]ν πέντε εἰς τὸ ἀντίζυγον. For the meaning of *κατάρακτης*, cf. Müller, *l.c.* p. 67. The shutters seem to have been composed of horizontal planks strengthened by two vertical cross-pieces (*ἀντίζυγα*), each nailed on with five nails. Frickenhaus, *l.c.* p. 36, states that the city wall did not have a screen-wall with windows, but simply crenelated battlements, and that the shutters therefore were hinged at the bottom. But the word *ἑπαλξίς*, the occurrence of which in lines 76, 80, 81, 86 he regards as evidence for this view, is used also in connection with the wall with windows, line 56. The passageway had an *ὀροφή* (l. 89), as he admits; and there is no reason to suppose that it differed from the structure described above.

<sup>2</sup> Line 82 ῥ[α]χώσας καὶ ὀ[σ]τρακώ[σας]. On the meaning of these words, see Müller, *l.c.* p. 68.